

Research Note

Helminths of the Day Geckos, *Rhoptropus afer* and *Rhoptropus barnardi* (Sauria: Gekkonidae), from Namibia, Southwestern Africa

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ABSTRACT: Twenty specimens each of the day geckos *Rhoptropus afer* and *R. barnardi* from Namibia, southwestern Africa, were examined for helminths. *Rhoptropus afer* harbored 4 species of nematodes, *Maxvachonia dimorpha*, *Parapharyngodon rotundus*, *Spauligodon petersi*, and *Physocephalus* sp. *Rhoptropus barnardi* harbored 1 species of cestode, *Oochoristica truncata*, and 6 species of nematodes, *Maxvachonia dimorpha*, *Parapharyngodon rotundatus*, *Spauligodon petersi*, *Physalopteroides impar*, *Thubunaea fitzsimonsi*, and *Physocephalus* sp. *Rhoptropus afer* and *R. barnardi* represent new host records for these helminths.

KEY WORDS: *Rhoptropus afer*, *Rhoptropus barnardi*, Gekkonidae, Nematoda, *Maxvachonia dimorpha*, *Spauligodon petersi*, *Parapharyngodon rotundatus*, *Physalopteroides impar*, *Thubunaea fitzsimonsi*, *Physocephalus* sp., Cestoda, *Oochoristica truncata*.

The genus *Rhoptropus* is composed of 6 species of diurnal geckos endemic to arid and semi-arid zones of Namibia and southern Angola, Africa (Bauer and Good, 1996). There are no reports on helminths from any species of *Rhoptropus*. The purpose of this note is to report helminths from *Rhoptropus afer* Peters, 1869 and *R. barnardi* Hewitt, 1926 from Namibia, Africa. *Rhoptropus afer* occurs in rocky desert from the Kuiseb River to southern Angola; *R. barnardi* inhabits semidesert environments and occurs inland in the western half of Namibia from Damaraland north to southern Angola (Branch, 1988). *Rhoptropus afer* occupies granite outcrops surrounded by sandy substrates; reptile diversity is low in these areas, with almost no amphibians present. *Rhoptropus barnardi* was taken from boulders in areas ranging from semiarid savanna to arid basalt plains.

Twenty each of *R. afer* and *R. barnardi* from Namibia were borrowed from the California Academy of Sciences (CAS) for helminthological examinations. *Rhoptropus afer* specimens were collected by one of us (A.M.B.) in 1987 (CAS 167677–167679, 167683, 167685, 13 km S of Cape Cross), 1989 (CAS 175396–175398, 175400, 175401, 56 km N of Cape Cross), and 1993 (CAS 193867–193876, 30 km N of Swakopmund); mean (\pm SD) snout–vent length (SVL) = 44.3 ± 2.6 mm (range, 37–48 mm). *Rhoptropus barnardi* specimens were collected in 1987 (CAS 167666, 167667, 63 km E of Kamanjab), 1989 (CAS 175334–175337, 9 km S of Kamanjab, CAS 175345, 175355, 175358, 175375, 6 km W of Kamanjab, CAS 175385, 175386, 175388, 175390, 175391, 21°50'S, 15°10'E) or 1993 (CAS 193775, 193779, 193781–193783, Epupa Falls); SVL = 41.3 ± 1.9 mm (range, 37–45 mm).

The abdominal cavity was opened, and the esophagus, stomach, and small and large intestines were removed, slit longitudinally, and examined under a dissecting microscope. The lungs, liver, and body cavity were also visually inspected for helminths. Each helminth, formalin-fixed in situ, was removed to a vial of 70% ethanol for a minimum of 48 hr and then cleared on a glass slide in undiluted glycerol. Selected cestodes were washed in distilled water, stained with hematoxylin, and mounted on glass slides in balsam. Identifications were made from these preparations (glycerol or balsam) utilizing a compound microscope. Prevalence, mean intensity, mean abundance, and locations are given in Table 1. Terminology is in accordance with Bush et al. (1997).

Rhoptropus afer harbored 4 species of nema-

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Table 1. Helminths from *Rhoptropus afer* (*n* = 20) and *R. barnardi* (*n* = 20) from Namibia, southwestern Africa.

Host Helminth	Prevalence (%)	Intensity		Abundance ($\bar{x} \pm SD$)	Location
		$\bar{x} \pm SD$	Range		
<i>Rhoptropus afer</i>					
<i>Maxvachonia dimorpha</i>	10	1.0		0.10 ± 0.31	small intestine
<i>Parapharyngodon rotundatus</i>	15	2.0 ± 1.7	1–4	0.30 ± 0.92	large intestine
<i>Spauligodon petersi</i>	25	7.4 ± 5.0	2–12	1.85 ± 4.00	large intestine
<i>Physocephalus</i> sp. (encysted larvae)	20	13.5 ± 17.4	1–39	2.70 ± 8.86	peritoneal surfaces
<i>Rhoptropus barnardi</i>					
<i>Oochoristica truncata</i>	5	1.0		0.05 ± 0.22	small intestine
<i>Maxvachonia dimorpha</i>	5	1.0		0.05 ± 0.22	small intestine
<i>Parapharyngodon rotundatus</i>	15	3.3 ± 4.0	1–8	0.50 ± 1.79	large intestine
<i>Spauligodon petersi</i>	30	4.0 ± 2.4	1–8	1.20 ± 2.26	large intestine
<i>Physalopteroides impar</i>	15	1.0		0.15 ± 0.37	stomach
<i>Thubunaea fitzsimonsi</i>	10	2.0 ± 1.4	1–3	0.20 ± 0.70	stomach
<i>Physocephalus</i> sp. (encysted larvae)	10	4.5 ± 5.0	1–8	0.45 ± 1.79	peritoneal surfaces

todes: *Maxvachonia dimorpha* Chabaud and Brygoo, 1960, *Parapharyngodon rotundatus* (Malan, 1939), *Spauligodon petersi* Bursey, McAllister and Freed, 1997, and *Physocephalus* sp. (larvae in cysts); *R. barnardi* harbored 1 species of cestode, *Oochoristica truncata* Zschokke, 1905, and 6 species of nematodes, *M. dimorpha*, *P. rotundatus*, *S. petersi*, *Physalopteroides impar* (Malan, 1939), *Thubunaea fitzsimonsi* (Ortlepp, 1931), and *Physocephalus* sp. (larvae in cysts). Selected helminths were placed in vials of 70% ethanol and deposited in the U.S. National Parasite Collection (USNPC), Beltsville, Maryland: *R. afer*: *M. dimorpha* (USNPC 87604), *P. rotundatus* (USNPC 87605), *S. petersi* (USNPC 87606), and *Physocephalus* sp. (larvae) (USNPC 87607); *R. barnardi*: *O. truncata* (USNPC 87608), *M. dimorpha* (USNPC 87609), *P. rotundatus* (USNPC 87610), *S. petersi* (USNPC 87611), *P. impar* (USNPC 87612), *T. fitzsimonsi* (USNPC 87613), and *Physocephalus* sp. (larvae) (USNPC 87614).

Oochoristica truncata (Linstowiidae) is probably the most common tapeworm of reptiles in Africa. It has been recorded from sub-Saharan reptiles such as the lizards *Agama aculeata*, *A. hispida*, and *A. planiceps* (Agamidae), *Chamaeleo namaquensis* (Chamaeleonidae), *Meroles knoxii* (Lacertidae) (Malan, 1939; Prudhoe and Harris, 1971; Heideman, 1991) and the snake *Psammophis sibilans* (Colubridae) (Fantham and Porter (1950). *Rhoptropus* is a new host genus for *O. truncata*.

Maxvachonia dimorpha (Cosmocercidae)

was described from the chameleon *Furcifer pardalis* from Madagascar (Chabaud and Brygoo, 1960) and has been reported from other Madagascan lizards, namely *F. oustaleti*, *Zonosaurus maximus*, and *Mabuya gravenhorstii* (Chabaud et al., 1964; Caballero, 1968). Here, we report the first 2 host records for this nematode from the African continent.

Parapharyngodon rotundatus (Oxyuroidea) was originally described as *Thelandros rotundus* based upon a large number of female and 15 male specimens from *A. atra* and *Pseudocordylus microlepidotus* collected in South Africa (Malan, 1939). Freitas (1957), in a revision of the genus *Thelandros*, moved the species to the genus *Parapharyngodon*. *Rhoptropus afer* and *R. barnardi* are the third and fourth lizard species reported to harbor *P. rotundatus*.

Spauligodon petersi (Oxyuroidea) was recently described from 45 female and 10 male specimens taken from 2 *Mabuya sulcata* collected in Springbok, Northern Cape Province, South Africa (Bursey et al., 1997). *Rhoptropus afer* and *R. barnardi* are the second and third species reported to harbor *S. petersi*.

Physalopteroides impar (Physalopteroidae) was originally described as *Thubunaea impar* on the basis of 24 female and 11 male specimens obtained from the stomach of 1 *Cordylus cordylus* collected at Wellington, South Africa; 2 immature individuals were found in the stomach of 1 *A. atra* (Malan, 1939). Chabaud and Brygoo (1960) revised the genus *Thubunaea*, moving *T. impar* to the genus *Physalopteroides*. Ca-

ballero (1968) subsequently described a subspecies of *P. impar*, *P. i. minor*, taken from 1 *Lygodactylus verticillatus*, 1 *M. comorensis*, and 3 *Cryptoblepharus boutonii* collected on Europa Island, Madagascar. *Rhoptropus barnardi* is the sixth species of lizard reported to harbor *P. impar*.

Thubunaea fitzsimonsi (Physalopteroidea) was originally described from 15 female and 2 male specimens obtained from the stomach of 1 *Ichnotropis squamulosa* collected in the Damara Pan, Botswana (Ortlepp, 1931). *Rhoptropus barnardi* is the second species of lizard reported to harbor *T. fitzsimonsi*.

Encapsulated infective larvae of *Physocephalus* sp. commonly occur in the tissues of amphibians, reptiles, birds, and mammals (Anderson, 1992). The extent of infection of South African species is apparently unknown; however, Malan (1939) reported encysted unidentified larvae from the stomach wall of *A. atra*.

Currently, the life cycles of these helminths are unknown, although some assumptions can be made: *M. dimorpha*, *P. rotundatus*, and *S. petersi* infect a host directly, and *O. truncata*, *P. impar*, *T. fitzsimonsi*, and *Physocephalus* sp. require an insect intermediate host. *Maxvachonia dimorpha* and *P. impar* have been reported from Madagascar and the African continent, but the other helminths found in this study are only known from continental Africa. The lizards previously noted as hosts were mostly arid zone reptiles, but whereas some of the lizards were restricted to particular arid regions (Namib for *Rhoptropus*, Kalahari for *Ichnotropis squamulosa*, Karoo for many "Cape" lizards), the helminths show no such barriers. The presence of some of the same helminth species in phylogenetically, ecologically, and geographically diverse lizards may suggest they are ubiquitous, or nearly so, in insectivorous lizards of the African subcontinent. However, more work will be required to understand which reptiles are capable of harboring these helminths.

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